

Chronology of NASA Expendable Vehicle Missions Since 1990

April 2001

Launch Date	Payload	Launch Vehicle	Site¹
June 1, 1990	ROSAT (<i>Roentgen Satellite</i>) NASA/German payload; U.S. Air Force vehicle. Launched into Earth orbit.	Delta II (Delta 195)	ETR, LC 17A
July 25, 1990	CRRES (<i>Combined Radiation and Release Effects Satellite</i>) NASA payload; launch vehicle services contract. Launched into Earth orbit.	Atlas I (AC-69)	ETR, LC 36B
May 14, 1991	NOAA-D (TIROS) (<i>National Oceanic and Atmospheric Administration-D</i>) A Television Infrared Observing System (TIROS) satellite. NASA-developed payload; USAF vehicle. Launched into polar Earth orbit.	Atlas-E (Atlas 50-E)	WTR, SLC 4
June 29, 1991	REX (<i>Radiation Experiment</i>) USAF payload; NASA vehicle. Launched into Earth orbit.	Scout 216	WTR, SLC 5
June 7, 1992	EUVE (<i>Extreme Ultraviolet Explorer</i>) NASA payload; USAF vehicle. Launched into Earth orbit.	Delta II (Delta 210)	ER, LC 17A
July 3, 1992	SAMPEX (<i>Solar, Anomalous and Magnetospheric Particle Explorer</i>) NASA payload with German and U.S. instruments; NASA vehicle. Launched into Earth orbit.	Scout 215	WR, SLC 5
July 24, 1992	Geotail NASA/Japanese spacecraft. First launch under Medium Expendable Launch Vehicle (MELV) launch vehicle services contract. Geotail part of International Solar Terrestrial Program (ISTP). Launched into Earth orbit.	Delta II (Delta 212)	ER, LC 17A
Sept. 25, 1992	Mars Observer (mission failure) NASA payload; launch vehicle services contract. Achieved Mars Transfer orbit. Spacecraft ceased communication after Mars orbital entry burn.	Commercial Titan (CT-4)/ Transfer Orbit Stage (TOS)	ER, LC 40
Nov. 21, 1992	MSTI I (<i>Miniature Seeker Technology Integration I</i>) Strategic Defense Initiative Organization (SDIO) payload; NASA vehicle. Launched into Earth orbit.	Scout 210	WR, SLC 5

¹ Acronyms used:

ETR = Eastern Test Range. Includes Cape Canaveral Air Station, Fla.

WTR = Western Test Range. Includes Vandenberg Air Force Base, Calif.

ER = Eastern Range. Most current designation.

WR = Western Range. Most current designation.

LC = Launch Complex, Eastern Range.

SLC = Space Launch Complex, Western Range.

Launch Date	Payload	Launch Vehicle	Site ¹
June 25, 1993	RADCAL (<i>Radar Calibration Satellite</i>) USAF satellite; NASA vehicle. Launched into Earth orbit.	Scout 217	WR, SLC 5
Aug. 9, 1993	NOAA-I (TIROS) (<i>National Oceanic and Atmospheric Administration-I</i>) A Television Infrared Observing System (TIROS) satellite. NASA-developed payload; USAF vehicle. Launched into polar Earth orbit. Spacecraft ceased communication two weeks after nominal launch.	Atlas-E (Atlas 34-E)	WR, SLC 4
April 13, 1994	GOES-I (<i>Geostationary Operational Environmental Satellite-I</i>) NASA-developed payload for the National Oceanic and Atmospheric Administration (NOAA); launch vehicle services contract. Launched into geosynchronous Earth orbit.	Atlas I (AC-73)	ER, LC 36B
May 8, 1994	MSTI II (<i>Miniature Seeker Technology Integration II</i>) Ballistic Missile Defense Organization (BMDO, formerly SDIO) payload; NASA vehicle. Launched into Earth orbit.	Scout 218 (Last NASA Scout)	WR, SLC 5
Nov. 1, 1994	Wind NASA payload carrying international instruments; MELV launch vehicle services contract. Wind first of two missions in Global Geospace Science initiative, U.S. contribution to International Solar Terrestrial Physics (ISTP) program. Lunar swingby.	Delta II (Delta 227)	ER, LC 17B
Dec. 30, 1994	NOAA-J (TIROS) (<i>National Oceanic and Atmospheric Administration-J</i>) A Television Infrared Observing System (TIROS) satellite. NASA-developed payload; USAF launch. Launched into polar Earth orbit.	Atlas-E (Atlas 11-E)	WR, SLC 4
May 23, 1995	GOES-J (<i>Geostationary Operational Environmental Satellite-J</i>) NASA-developed payload for the National Oceanic and Atmospheric Administration (NOAA); launch vehicle services contract. Launched into geosynchronous Earth orbit.	Atlas I (AC-77)	ER, LC 36B
Nov. 4, 1995	RADARSAT; SURFSAT-1 (<i>Radar Satellite; Summer Undergraduate Research Fellowship Satellite-1</i>) RADARSAT cooperative effort between Canadian Space Agency, NASA, and NOAA. MELV launch vehicle services contract. Launched into low Earth orbit.	Delta II (Delta 229)	WR, SLC 2
Dec. 3, 1995	SOHO (<i>Solar and Heliospheric Observatory</i>) Payload a cooperative European Space Agency (ESA)/NASA effort; launch vehicle services contract. SOHO part of International Solar Terrestrial Program (ISTP). Halo orbit (937,000 miles/1.5 million kilometers) from Earth toward Sun.	Atlas IIAS (AC-121)	ER, LC 36B
Dec. 30, 1995	XTE (<i>X-ray Timing Explorer</i>) NASA payload; MELV launch vehicle services contract. Launched into low Earth orbit.	Delta II (Delta 230)	ER, LC 17A

Launch Date	Payload	Launch Vehicle	Site ¹
Feb. 17, 1996	NEAR (<i>Near Earth Asteroid Rendezvous spacecraft</i>) NASA payload; MELV launch vehicle services contract. Delta VEGA trajectory (Delta V/ Earth Gravity Assist).	Delta II (Delta 232)	ER, LC 17B
Feb. 24, 1996	Polar NASA payload; MELV launch vehicle services contract. Final mission of NASA's Global Geospace Science (GGS) program, the U.S. contribution to International Solar Terrestrial Physics (ISTP) effort (see also Wind, November 1994). Launched into elliptical polar orbit.	Delta II (Delta 233)	WR, SLC 2
July 2, 1996	TOMS-EP (<i>Total Ozone Mapping Spectrometer/Earth Probe Satellite</i>) Spacecraft designed for high-resolution measurements of ozone to map in detail the global ozone distribution as well as the Antarctic "ozone hole."	Pegasus-XL (M11)	WR
Aug. 21, 1996	FAST (<i>Fast Auroral Snapshot Explorer</i>) Spacecraft to observe the auroral regions by measuring rapidly varying electric and magnetic fields together with the associated acceleration of electrons, protons and ions. The science objective is to examine the processes and physical causes of complex auroral displays and how these processes affect the Earth.	Pegasus-XL (M20)	WR
Nov. 4, 1996 (launch failure)	SAC-B/HETE (<i>Satellite de Aplicaciones Cientificas-B/ High Energy Transient Experiment</i>) SAC-B, an international cooperative project between NASA and the nation of Argentina designed to advance the study of solar physics and astrophysics through examination of solar flares, gamma ray bursts, and diffuse cosmic X-ray background. The HETE mission was led by the Massachusetts Institute of Technology to study gamma ray bursts. SAC-B/HETE failed to accomplish its mission after the spacecraft did not separate from the rocket due to an upper battery failure.	Pegasus-XL (M18)	Wallops Flight Facility
Nov. 7, 1996	Mars Global Surveyor NASA payload; mission to map Mars' surface features and examine its atmosphere and magnetic properties.	Delta II (Delta 239)	ER, LC 17A
Dec. 4, 1996	Mars Pathfinder NASA payload; delivering a lander and small robotic rover, Sojourner, to the surface of Mars using direct entry, descent and landing; studying and recording data about ancient rocks.	Delta II (Delta 240)	ER, LC 17B
April 25, 1997	GOES-K (<i>Geostationary Operational Environmental Satellite-K</i>) Renamed GOES-10 once in orbit. Next-generation weather satellite providing improved weather imagery and atmospheric sounding information for NOAA.	Atlas I (AC-79)	ER, LC 36

Launch Date	Payload	Launch Vehicle	Site ¹
Aug. 1, 1997	SeaStar/SeaWiFS (<i>Sea-viewing Wide Field-of-View Sensor</i>) Oceanography instrument developed by NASA-Goddard Space Flight Center for the commercial SeaStar ocean surveillance satellite. Instrument provides ocean-color data for observation of living organisms and tracking of plankton blooms, outbreaks of red tide, oil spills or chemical pollution.	Pegasus-XL (M26)	WR
Aug. 23, 1997	Lewis (mission failure) Launched with the goal of demonstrating advanced science instruments and spacecraft technologies for measuring changes in earth's terrestrial surface. The spacecraft entered a flat spin in orbit that resulted in a loss of solar power and a fatal battery discharge. Contact with the 890-pound spacecraft was lost Aug. 26, and it re-entered the atmosphere on Sept. 28. The companion mission, Clark, was canceled by NASA due to cost overruns.	LMLV	SLC-6
Aug. 25, 1997	ACE (<i>Advanced Composition Explorer</i>) A spin-stabilized spacecraft investigating the origin and evolution of solar phenomenon, the formation of the solar corona, solar flares and the acceleration of the solar wind.	Delta II (Delta 247)	ER, LC 17A
Oct. 15, 1997	Cassini NASA-JPL spacecraft with international partners European Space Agency and Italian Space Agency; four-year exploratory mission of Saturn, its rings and 18 known moons. ESA's Huygens Probe to be deployed to the surface of Saturnian moon Titan.	Titan IV/Centaur (K33/TC-18)	ER, LC 40
Jan. 6, 1998	Lunar Prospector NASA-Ames Research Center spacecraft; mapping mission of the Earth's moon; recording gravitational and magnetic fields, identifying mineral composition on the surface, seeking clues about the lunar core, and successfully finding evidence of polar ice.	Athena	ETR, LC 46
Feb. 15, 1998	SNOE (<i>Student Nitric Oxide Explorer</i>) NASA-sponsored spacecraft built by the students of the University of Colorado at Boulder. The satellite measures the effects of the sun's x-ray radiation and magnetic field on nitric oxide production in the Earth's upper atmosphere which may affect climatic change.	Pegasus XL (M27)	WR
Apr. 1, 1998	TRACE (<i>Transition Region and Coronal Explorer</i>) NASA payload to improve understanding of events in the sun's atmosphere, including intense storms and flares.	Pegasus XL (M25)	WR

Launch Date	Payload	Launch Vehicle	Site ¹
May 13, 1998	NOAA-K (<i>National Oceanic and Atmospheric Administration-K</i>) Weather satellite for NOAA. Designated NOAA-15 once in space, the satellite provides high resolution pictures together with data of land and sea temperatures, vertical moisture profiles, and ozone measurements within the troposphere and stratosphere. NOAA-K has a Space Environment Monitor to provide warning of increases in solar wind, and a search and rescue (SARSAT) transponder for detection and relay of distress signals.	Titan II	WR, SLC-3E
Oct. 24, 1998	Deep Space 1 (DS1) Validated 12 advanced technologies, including an ion propulsion engine, in deep space to lower the cost and risk to future science-driven missions that may use them for the first time. The spacecraft also had a bonus encounter with asteroid 9969 Braille.	Delta II (Delta 7326-9.5 Med-Lite - first use of this model)	ER, LC 17A
Dec. 5, 1998	SWAS (<i>Submillimeter Wave Astronomy Satellite</i>) A two-year mission designed to help scientists gain a greater understanding of star formation by determining the composition of interstellar clouds, and establishing the means by which these clouds cool as they collapse to form stars and planets.	Pegasus XL	WR
Dec. 11, 1998	Mars Climate Orbiter (mission failure) One of the pair of Mars '98 missions. The orbiter was to be used primarily to support its companion, the Mars Polar Lander, by acting as a relay station for data transmissions to and from the lander and Earth, and to collect data about Mars. The spacecraft was lost on Sept. 23, 1999, after the orbiter fired its main engine to go into orbit around the planet.	Delta II (Delta 7425)	ER, LC 17A
Jan. 3, 1999	Mars Polar Lander (mission failure) One of the pair of Mars '98 missions. The lander was solar-powered and designed to touch down on the Martian surface near the northern-most boundary of the south pole to study the water cycle there. All communication with the spacecraft was lost on Dec. 3, 1999, after it attempted to land on the planet. Also lost were the Deep Space 2 microprobes aboard.	Delta II (Delta 7425)	ER, LC 17B
Feb. 7, 1999	Stardust The first comet sample return mission. Aerogel will be used to capture comet particles during a planned close encounter with comet Wild 2, as well as samples of interstellar dust, and return them to Earth from deep space. The reentry capsule is expected to parachute to Earth in 2006.	Delta II	ER, LC 17A
March 4, 1999	WIRE (<i>Wide-Field Infrared Explorer</i>) A Small Explorer mission designed to help astrophysicists understand the formation and evolution of "starburst" galaxies and search for distant ultra-luminous galaxies.	Pegasus XL	WR

April 15, 1999	Landsat 7 Used to acquire remotely sensed images of the Earth's land surface and surrounding coastal regions.	Delta II	WR, SLC 2
May 17, 1999	TERRIERS (<i>Tomographic Experiment using Radiative Recombinative Ionospheric EUV and Radio Sources</i>) Designed to study the ionosphere, the electrically charged portion of the Earth's upper atmosphere. This highly ionized area begins at an altitude of about 30 miles and extends to about 250 miles. Conditions there affect the quality of transmissions from communication satellites and is the region where Space Shuttle and Space Station missions take place.	Pegasus	WR
June 19, 1999	QuikSCAT (<i>Quick Scatterometer</i>) The primary instrument on the spacecraft is "Sea Winds," a specialized microwave radar to collect frequent, high-resolution measurements about the speed and direction of winds near the ocean surface. It is part of NASA's Earth Observing System (EOS) which is designed to address global environmental changes, regional weather patterns and climate.	Titan II	WR, SLC 4W
June 24, 1999	FUSE (<i>Far Ultraviolet Spectroscopic Explorer</i>) This space telescope was designed to scour the cosmos for the fossil record of the origins of the universe. It will be used to study the earliest relics of the Big Bang—hydrogen and deuterium—and thereby, to determine how the primordial chemical elements of which all the stars, planets and life evolved, were created and distributed since the birth of the Universe.	Delta II	ER, LC 17A
Dec. 18, 1999	Terra The flagship in a new series of satellites that are part of the U.S. Global Change Research Program. It takes a global approach to data collection, enabling scientists to study the interaction among the four spheres of the Earth system—the oceans, lands, atmosphere and biosphere.	Atlas IIAS (AC-141)	WR, SLC 3E
Dec. 21, 1999	ACRIMSAT (<i>Active Cavity Radiometer Irradiance Monitor Satellite</i>) A five-year science mission designed to measure the total amount of sunlight falling on Earth's atmosphere, oceans and land, and improve predictions of long-term climate change.	Taurus	WR, SLC 576E
Mar. 25, 2000	IMAGE (<i>Imager for Magnetopause-to-Aurora Global Exploration</i>) A two-year mission for a first of its kind satellite, dedicated to imaging the Earth's magnetosphere—an invisible magnetic field surrounding the planet that is strongly influenced by the solar wind.	Delta II (Delta 7326)	WR SLC 2
May 3, 2000	GOES-L (<i>Geostationary Operational Environmental Satellite-L</i>) NOAA weather satellite. Its primary objective is to provide a full capability satellite in an on-orbit storage condition, in order to assure NOAA continuity in services from a two-satellite constellation. Once in orbit, it was designated GOES-11.	Atlas II	ER, LC 36A

June 30, 2000	TDRS-H (<i>Tracking and Data Relay Satellite-H</i>) One of three satellites (labeled H, I and J) built by the Hughes Space and Communications Company, This TDRS uses an innovative springback antenna design. A pair of flexible mesh antenna reflectors, 15 feet in diameter, fold up for launch, then spring back into their original cupped circular shape on orbit. The new satellites will augment the TDRS system's existing S- and Ku-band frequencies by adding Ka-band capability. TDRS will serve as the sole means of continuous, high-data-rate communication with the space shuttle, with the International Space Station upon its completion, and with dozens of unmanned scientific satellites in low earth orbit.	Atlas IIA (AC-139)	ER, LC 36A
Sept. 21, 2000	NOAA-L (<i>National Oceanic and Atmospheric Administration-L</i>) Weather satellite for NOAA and the latest in the advanced TIROS-N series. It will continue the provision of a polar-orbiting platform to support the environmental monitoring instruments for imaging and measurement of the Earth's atmosphere, surface, and cloud cover, including Earth radiation, atmospheric ozone, aerosol distribution, sea surface temperature, vertical temperature and water profiles in the troposphere and stratosphere; measurement of proton and electron flux at orbit altitude, and remote platform data collection, and for SARSAT.	Titan II	WR, SLC 4W
Oct. 9, 2000	HETE-2 (<i>High Energy Transient Explorer-2</i>) Designed to detect and localize gamma ray bursts and other explosive cosmic phenomena. An international mission, it replaces the original HETE, which was lost to a rocket launch failure in Nov. 1996.	Pegasus	Kwajalein
Nov. 21, 2000	EO-1/SAC-C (<i>Earth Observing-1/Satelite de Aplicaciones Cientificas-C</i>) The New Millennium Program's first Earth Observing flight (EO-1), managed by NASA's Goddard Space Flight Center (GSFC), will validate revolutionary technologies contributing to the reduction in cost and increased capabilities for future land imaging missions. SAC-C is designed to advance the study of solar physics and astrophysics through the examination of solar flares, gamma ray bursts, diffuse X-ray cosmic background and energetic neutral atoms.	Delta 7320-10	WR SLC 2W
April 7, 2001	2001 Mars Odyssey The 2001 Mars Odyssey spacecraft, built by Lockheed Martin Space Systems for the Jet Propulsion Laboratory, is designed to map the Martian surface. It will search for geological features that could indicate the presence of water, now or in the past, and may contribute significantly toward understanding what is necessary for a more sophisticated exploration of Mars.	Delta 7925	ER, LC 17A